

PSEUDO-CODE FOR CENBLOCK PROGRAM

- get_parameters;
- setup_grid;
- attach_mesh_areas;
- while over_max_pop do
adjust_grid_areas;
- build_serving_areas;

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get_parameters;

Loads user-defined values for parameters, including size of grid, maximum allowable population within a distribution area, size of microgrid (if user desires to preset this), and take rate for households.

setup_grid;

Using data from included Census blocks, calculates upper left and lower right corners of area to be "gridded." Writes corners of grid blocks to file.

Mountain Bell - MT Census Blocks



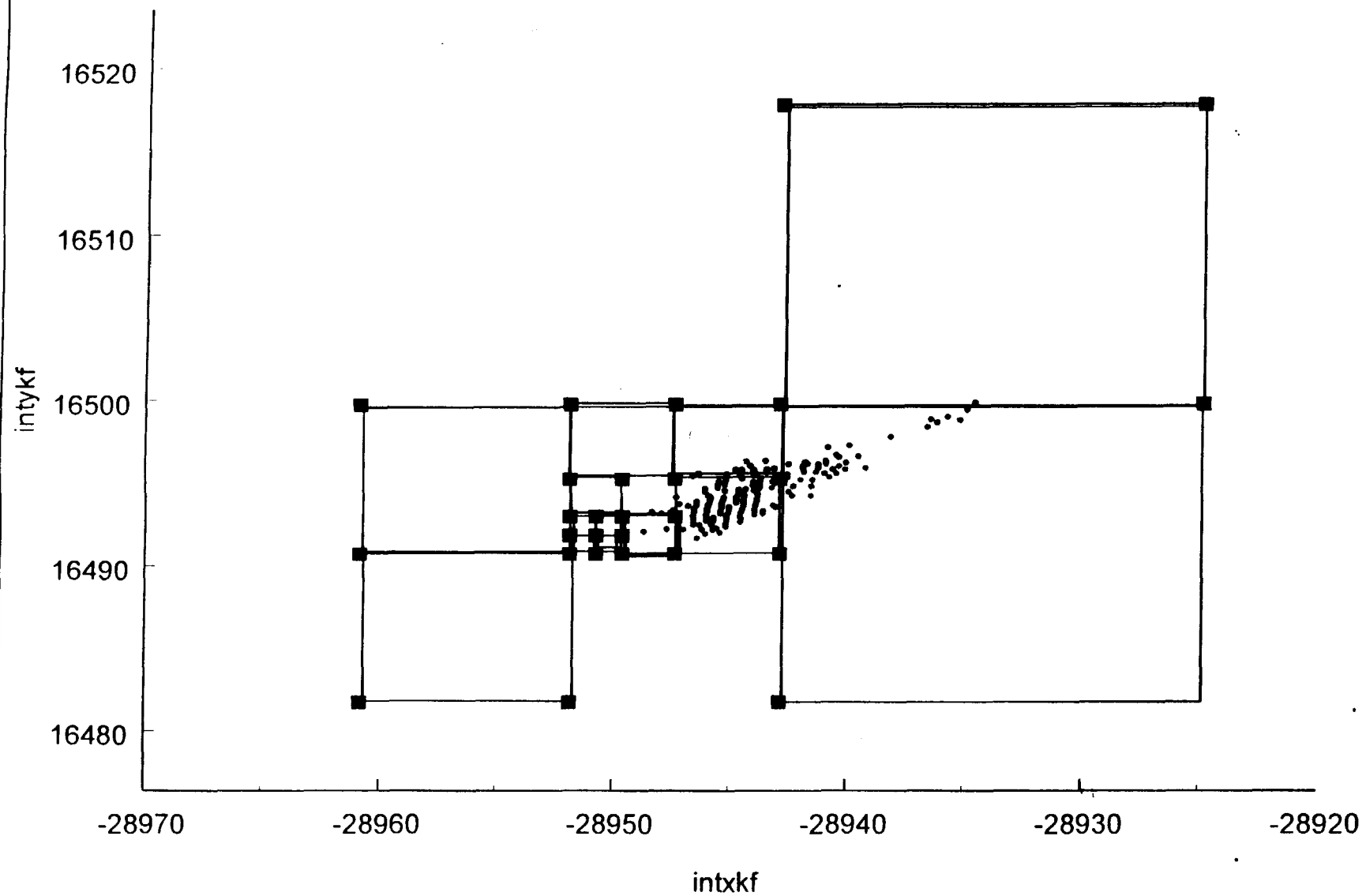
```
attach_mesh_areas;
```

Loops through each grid block created above, and attaches all Census blocks that fall within that grid by saving "addresses" in a file. Also tabulates the number of lines within each grid block and saves info to file.

```
while over_max_pop do  
    adjust_grid_areas;
```

Over_max_pop is a Boolean function that returns "TRUE" if any grid block has a number of lines over the maximum defined in the parameter file. If any such grid blocks exist, adjust_grid_areas divides them into smaller square grids and determines which Census blocks are attached to the smaller grids.

Illustration of subdividing gridblocks to handle "overpopulation"



```
build_serving_areas;
```

This module accomplishes two tasks
before writing distribution area data
to file

Sets up microgrid within each grid block

It grids each grid block to determine the location of the Census blocks contained within it. If this microgrid is preset by the user, it will use that value; otherwise, it will determine the average area of included Census blocks to determine a microgrid size.

Optimize SAI locations

Optimizes the location of each serving area interface by minimizing a “cost function” that assigns a penalty to any SAI location:

$$Cost(x,y) = \begin{cases} 1.0 \times 10^{16}, & \text{if } \exists i \text{ s.t. } d([x,y], [xmid_i, ymid_i]) > 18 \\ \sum_i d([x,y], [xmid_i, ymid_i]) \times pop_i, & \text{otherwise} \end{cases}$$

[illegible]

More than one SAI?

The program now asks the question,
“if we were to put more than one
SAI in this gridblock, where would
the SAIs be?” and performs
location optimization of up to four
SAIs